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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/656,942	09/07/2000	SHINJIRO OKADA	684.3072	2276

5514 7590 01/02/2004

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NEW YORK, NY 10112

EXAMINER	
HON, SOW FUN	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 01/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/656,942	OKADA ET AL.	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *1* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-7,9,11-14* is/are rejected.

7)☒ Claim(s) *8 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

Allowable Subject Matter

1. Claims 8, 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Priority

2. The certified translations of each of the priority applications 255007/1999 and 273878/1999 are acknowledged. The condition for foreign priority under 35 U.S.C. 119 is met

Withdrawn Rejections

3. The 35 U.S.C. 103(a) rejections of claims 2-14 using Kanbe et al. as prior art have been withdrawn due to Applicant's establishment of foreign priority as stated above.

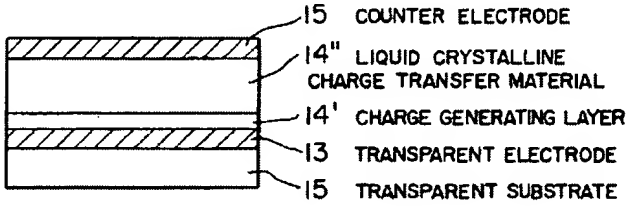
New Rejections

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 11-12, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanna et al.

Hanna et al. teaches an organic electroluminescence device, shown below, comprising a pair of oppositely spaced electrodes (13, 15), a carrier transporting layer (14'' charge transfer) and a luminescent organic layer (14' charge generating) disposed in lamination between the electrodes so that the carrier transporting layer is disposed in contact with one of the electrodes. The liquid crystalline charge transport materials have conjugated π-electron resonance structures (aromatic ring of 6 π electron system)n where n is an integer of 1 to 4 (column 7, lines 35-45) and exhibit smectic liquid crystallinity (column 7, lines 5-10). Hanna et al. teaches that these liquid crystalline charge transport materials are used in electroluminescence devices by virtue of having excellent charge transport properties, as well as in display devices (column 7, lines 55-70) which can also be liquid crystal display devices.



6. Claims 3-5, 7, 9, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanna et al. in view of Katz et al. (US 6,017,470) and Calvert et al. (US 5,976,284).

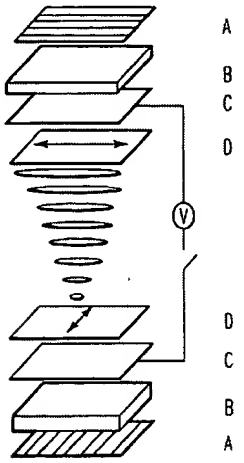
Hanna et al. has been discussed above and teaches an organic electroluminescent device comprising a pair of oppositely spaced electrodes, a carrier transporting layer and a luminescent organic layer disposed in lamination between the electrodes so that the carrier transporting layer is disposed in contact with one of the electrodes, wherein the

carrier transporting layer comprises a conductive liquid crystal having a π-electron resonance structure in its molecule.

In addition, even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985).* In the instant case, although Hanna et al. fails to teach that the luminescent organic layer and the carrier transporting layer are formed by vacuum deposition, vacuum deposition provides layers that are the same or similar to other known methods of layer deposition.

Hanna et al. fails to teach that the π-electron resonance structure plane of the liquid crystal is aligned parallel to the surfaces of the electrodes.

Calvert et al. is directed to liquid crystal displays (column 1, lines 10-20) and shows, in Fig. 6 on the next page, a liquid crystal cell wherein the planes of the disc-shaped liquid crystal forms in between alignment layers D are stacked in a column with the planes being aligned perpendicular to the cylindrical axis of the column and parallel to the surfaces of the electrodes (conducting polymer layers C). The disc-shape gives rise to the term "discotic".



CONDUCTING POLYMER TWISTED NEMATIC CELLS

A: POLARIZER/ANALYZER
B: SUBSTRATE: PET, FEP, GLASS
C: CONDUCTING POLYMER: PPY, PANI
D: ALIGNMENT LAYER: RUBBED PPY OR PANI
RUBBED POLYIMIDE,
NON-RUBBED ALIGNMENT LAYER

Calvert et al. thus demonstrates that it would have been obvious to one of ordinary skill in the art to have stacked the planar aromatic liquid crystal charge transport carriers in the invention of Hanna et al. ('510, column 7, lines 35-45) parallel to the surfaces of the electrodes, so that the π-electron resonance structure plane of the liquid crystal is aligned parallel to the surfaces of the electrodes.

It follows that although neither Calvert et al. or Hanna et al. teaches heat treatment of the device, the end product as made obvious by Calvert et al. is a structure wherein the planar aromatic liquid crystal charge transport carriers in the invention of Hanna et al. ('510, column 7, lines 35-45) are parallel to the surfaces of the electrodes, so that the π-electron resonance structure plane of the liquid crystal is aligned parallel to the surfaces of the electrodes.

Hanna et al. fails to teach that the liquid crystal is in a discotic columnar phase.

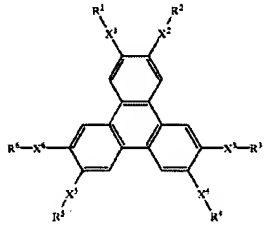
Katz et al. discloses prior art (workers) which teach columnar discotic molecules wherein the molecules stack in cylindrical columns in which the planes of aromatic rings are perpendicular to the cylindrical axis of the column (column 1, lines 15-25 and column 4, lines 55-65). The devices taught by Katz et al. are liquid crystal display devices and other optical devices (abstract).

Katz et al. thus demonstrates that it would have been obvious to one of ordinary skill in the art to have stacked the planar aromatic ring systems of the liquid crystal charge transport carriers in the invention of Hanna et al. ('510, column 7, lines 35-45) parallel to the surfaces of the electrodes, so that the liquid crystal forms a discotic columnar phase.

7. Claims 3-4, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamano et al. in view of Katz et al. (US 6,017,470) and Calvert et al. (US 5,976,284).

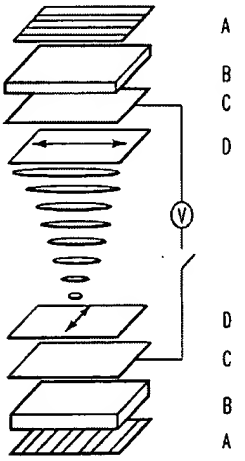
Tamano et al. teaches an organic electroluminescent display device (column 1, lines 5-10) which has a luminescent organic layer (light-emitting layer) disposed between a pair of oppositely spaced electrodes (in lamination between a pair of electrodes) (column 1, lines 25-35). A hole-injecting material, taught as a separate layer from the luminescent layer (column 76, lines 60-65), is used as an electron charge-transporting carrier (material) for the electron charge-transporting layer by adding an electron-attracting substituent (column 75, lines 65-70). The carrier transporting (hole injecting) material is an amorphous thin film (column 76, lines 35-45) which means that the laminated light-emitting layer (thin film) is also amorphous. The carrier transporting material (compound) is vacuum deposited (column 81, lines 25-35). The carrier transporting material has the planar triphenylene core structure on the next page (column

2, lines 35-55) which is a conjugated π-electron resonance structure due to the fused aromatic rings.



Tamano et al. fails to teach that the planar aromatic electron charge-transporting carrier has its π-electron resonance structure plane aligned parallel with the electrode substrates.

Calvert et al. is directed to liquid crystal displays (column 1, lines 10-20) and shows in Fig. 6 below a liquid crystal cell wherein the planes of the disc-shaped liquid crystals forms in between alignment layers D are stacked in a column with the planes being aligned perpendicular to the cylindrical axis of the column and parallel to the surfaces of the electrodes (conducting polymer layers C). The disc-shape gives rise to the term "discotic".



CONDUCTING POLYMER TWISTED NEMATIC CELLS

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B: SUBSTRATE: PET, FEP, GLASS
C: CONDUCTING POLYMER: PPY, PANI
D: ALIGNMENT LAYER: RUBBED PPY OR PANI
RUBBED POLYIMIDE,
NON-RUBBED ALIGNMENT LAYER

Calvert et al. thus demonstrates that it would have been obvious to one of ordinary skill in the art to have stacked the planar aromatic liquid crystal charge transport carriers in the invention of Tamano et al. ('042, column 2, lines 35-55) parallel to the surfaces of the electrodes, so that the π-electron resonance structure plane of the liquid crystal is aligned parallel to the surfaces of the electrodes.

Response to Arguments

8. Applicant's arguments with respect to claims 2-14 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (703)308-3265 or (571)272-1492 after December 29, 2003. The examiner can normally be reached Monday to Friday from 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (703)308-4251 or (571)272-1498 after December 29, 2003. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9310.

Sow-Fun Hon
12/24/03

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772
12/29/03